

TMDL Impacts on Algal Productivity

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Public Comments

No public comments were received for this proposal.

Technical Synthesis Panel Review

Proposal Title

#0248: TMDL Impacts on Algal Productivity

Final Panel Rating
inadequate

Technical Synthesis Panel (Primary) Review

TSP Primary Reviewer's Evaluation Summary And Rating:

When I read this proposal, my immediate impression was that it was poorly thought out and a more bureaucratic than scientific response to a vague problem. In the Executive Summary, it is stated that activities in the river basin will cause "cascading effects on phytoplankton productivity and community structure". While on face value, this statement is probably true, it is so vague that it is meaningless. I strongly support the idea of the need for better understanding the impact of land-use activities on phytoplankton and hence ecosystems. A large portion of aquatic research in the US and worldwide addresses various aspects of this general area. However, I do not find clearly stated goals, hypotheses, and/or objectives nor a clear plan to address these. I do not find this proposal compelling for support.

Additional Comments:

I am sorry for such a definitive negative review, but the proposal is just not on the same level of most of the others that I have reviewed.

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#0248: TMDL Impacts on Algal Productivity

Technical Synthesis Panel Review

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Technical Synthesis Panel (Discussion) Review

TSP Observations, Findings And Recommendations:

This proposal addresses a number of very important questions; however, it had a number of significant deficiencies. Many of these were identified in the technical reviews. Overall, the goals and hypotheses were not clearly stated, nor was the research plan for addressing them. The impact of land use activities on phytoplankton and ecosystems is an important research area. However, it is also one with many past and recent activities, and this proposal does not provide new ideas nor clear approaches to the problem.

Technical Review #1

proposal title: TMDL Impacts on Algal Productivity

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	<p>Unfortunately, the specific goals of this proposal are not clear and portray a project that is a collection of many individual methods and ideas that are not clearly articulated. There are numerous places in the first few pages of the proposal to clearly state the objectives but they all convey somewhat different thoughts:</p> <p>The title 'TMDL Impacts on Algal Productivity' implies a strong connection to the ongoing TMDL efforts in the region; however, there is very little mention of TMDLs in the remainder of the proposal and essentially no detail. The title also seems to limit the proposed work to algae; however the proposal includes significant work with zooplankton, methods development and modeling. While all could be pulled together into an integrated effort, they are not.</p> <p>The Executive Summary lays out four tasks that are the most consistent element of the proposal throughout: (1) algal and water quality descriptive work; (2) algal mesocosm and bioreactor simulations; (3) molecular and instrument development; and (4) extension of an existing 3D hydrodynamic and water quality model. Unfortunately, these neither match the title nor are they internally consistent with the three Goals & Objectives listed on page 4.</p>
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Technical Review #1

	While I will provide considerable review input below, the basic inability of the PIs to articulate and integrate the widely varying approaches outlined in the proposal into a coherent theme is a weakness that I do not believe can be overcome. The proposed research is complex and will require significant integration to be successful. It is difficult to have confidence in the potential to integrate the research when the proposal is not well integrated itself.
Rating	fair

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

Comments	<p>It is clear that there are significant water quality issues in the SJR and that algal productivity can be affected by changes water quality changes that have and will occur. It is also accepted that algal production is linked to the health of higher trophic levels, although no direct evidence has been provided. This proposal would be improved considerably if the PIs provided discussion/figures for the numerous references made to 'preliminary data have shown' (e.g. Pg5/Par1/Ln1-2; Pg6/Par3/Ln12-14; preliminary data would be useful in support of Pg11/Par2; Pg14/Par2; Pg16/Par1/Ln4-6; Pg20/Par5/Ln6-8; etc...).</p> <p>While detailed surveys, PAM fluorometers, stable isotopes, 3D modeling, fluorescence measurements, diel measurements, TDML, DNA methods, in situ nutrient monitoring, and biological monitoring/indices are all pertinent catch phrases it is essential that these elements be pulled together into a complete and integrated package.</p>
Rating	poor

Technical Review #1

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	<p>As detailed above, the approaches, while useful as independent techniques, are not adequately integrated in the proposal. There are many places in which there is insufficient information to be able to pass judgment on the potential for success. For example: How will data from the bioreactors be used? How will isotope data be used to determine how much of the diel changes in DO and nitrate are caused by photosynthesis vs respiration (Pg12/Par2/Ln7-8)? How long will mesocosm experiments be carried out for (Pg19/Par2)? If DNA fingerprinting methods are successfully developed, how will the fingerprints be used to test the impacts of TMDLs on algal productivity?</p> <p>There are also too many instances where individual methods are mentioned but not connected to the overall goals of the proposal. For example, what question is being addressed by collecting and analyzing C and N isotopes (Pg24/Par4)? These are fair methods, but they are not connected to the core questions of the proposal.</p>
Rating	fair

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	Based on the above mentioned deficiencies, I do not believe that this project has any likelihood of overall success although good information could be obtained from individual
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Technical Review #1

	efforts.
Rating	fair

Monitoring

If applicable, is monitoring appropriately designed (pre–post comparisons; treatment–control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	There is insufficient information on the monitoring aspects of this proposal to make an assessment. There is no mention about how the data generated will be compared and analyzed beyond the mention of a QAPP on Pg29. New methods (e.g. a phaeophytin detector are proposed, but there are no details as to how this would be used to monitor other than a broad mention of Chl/Phaeo ratios (and this is incorrect when it references physiological health in a mixed natural assemblage as there are naturally occurring degradation products present even when some species may be physiologically healthy).
Rating	poor

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	Some individual products may be of value, but I feel that it is unlikely that the overall goals of the project will be able to be integrated in a way that addresses the broad goals of the proposal.
Rating	good

Additional Comments

Comments	<p>Pg4/Par1 - This goal of assessing 'ecosystem integrity' is not addressed in the proposal.</p> <p>Pg4/Last Bullets - Quantifying community dynamics in response to 'environmental stress' and understanding the 'diel cycling of algal biomass' are not articulated with regard to the core objectives stated in the Executive Summary and the Project Purpose.</p> <p>Pg5/Par1 - Provide reference for the first sentence.</p> <p>Pg8/Par3/Ln8-10 - The statement that Fluorescence has been used to provide a reliable measure of biomass seems inconsistent with the proposed justification of the need to develop new techniques that incorporate phaeophytin to develop better methods.</p> <p>There are numerous cases of poor editing. For example, Pg9/Par4 is attempting to focus on the Diel Cycling measurements but digresses into Tasks 2 Similarly, Pg23/Par2 seems either out of place or poorly articulated.</p> <p>There is a lack of clarity as to what is meant when 'sampled at all stations' is referred to. In some cases, the PIs seem to be referencing all longitudinal stations, but then there are questions related to diel cycles that clearly require sampling of the diel parameters. This requires clarification.</p> <p>Pg11/Par3 - It is not clear how high resolution nutrient data are going to be used.</p>
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Technical Review #1

Pg13/Par2/Ln3 - Is the reference to most POM being algal for the SJR? In either case, this should be referenced.

Pg14/Par4 - The phytoplankton enumeration is a huge effort (assuming that it will include all diel samples in order to carry out the biomass estimates) that does not seem to be captured in the budget.

Pg16/Par1 - If temperature and flow can be 'reliably' used to predict daily chlorophyll loads, what is much of the work detailed in this proposal necessary?

Pg17/Par5 - The isotope component of the work detailed here seems to be an add-on that simply isn't adequately integrated into the proposal. This is the most striking case; however, there is insufficient justification for the PAM, high frequency nutrients, fatty acids, etc... as well.

Pg18/Par1 - Explain/reference Ludox ultrafiltration.

Pg19/Par2/Ln11 - Figure 1.1; lack of editing?

Pg20/Par2/Ln2-3 - Provide clarity on how you plan to manipulate nutrients. It seems that this should be tied to details of the TMDL implementation.

Task 3.3 (pheophytin sensor) - Who is going to develop this?

Task 4 (Algal and Water Quality Model) - This section is not integrated into the rest of the proposal and seems like standard boilerplate for the model. The model is a critical end-point to the proposed work and

Technical Review #1

	needs to reflect the specific goals of the project.
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Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	I am sure that PIs bring much talent to the proposal; however, for such a large and integrative proposal, it is striking that only a two of the PIs are referenced with work pertinent to the proposed work.
Rating	not applicable

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	For the proposed budget of \$4.6M, CALFED should expect a much better developed and integrated proposal.
Rating	fair

Overall

Provide a brief explanation of your summary rating.

Comments	As noted above, the basic inability of the PIs to articulate and integrate the widely varying approaches outlined in the proposal into a coherent theme is a weakness that I do not believe can be overcome. The proposed research is complex and will require significant integration to be successful. It is difficult to have confidence in the potential to integrate the research when the proposal is not well integrated itself. For the proposed budget of \$4.6M, CALFED should expect a much better developed and integrated proposal.
Rating	

Technical Review #1

fair

Technical Review #2

proposal title: TMDL Impacts on Algal Productivity

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	This proposal seems to be a grab bag of new techniques aimed at addressing water quality issues in the SJR. This seems like an engineering approach to a biological question. Hypotheses and methods are not especially well justified
Rating	fair

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

Comments	Background information is not clearly presented. Conceptual model does not seem to fit with current ecological theory. The large scale, extensive field sampling, mesocosm and experimental approach is not well justified.
Rating	fair

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Technical Review #2

Comments	Again, the approach seems like a grab bag of assorted techniques. With the exception of the stable isotope work, the PI's have very limited experience (in terms of peer reviewed publications) with the proposed methods.
Rating	fair

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success?
Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	The approaches are somewhat documented. Some methods are thrown out like they are straightforward (identifying phytoplankton and zooplankton with DNA fingerprinting), yet these are not routinely done and their success is far from assured. It makes sense to use this approach with bacteria where there are no routine morphological or chemical characteristics to base species identifications on, but this is not the case with phytoplankton or zooplankton. These would be challenging goals for experts in the field; they could be nearly impossible for researchers with little experience with these organisms.
Rating	fair

Monitoring

If applicable, is monitoring appropriately designed (pre–post comparisons; treatment–control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	Monitoring design is acceptable. This is a group of engineers, and they know how to design a monitoring study.
Rating	good

Technical Review #2

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	Based on past performance, these investigators can be expected to produce technical reports explaining the results of this study. With a couple of exceptions, the PI's do not have extensive publication records of peer reviewed publications.
Rating	fair

Additional Comments

Comments

Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	The main focus of this proposal is studying the plankton of the SJR. None of the PI's has a background or reputation as a plankton biologist or ecologist.
Rating	poor

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	The budget seems expensive. This project comes across as a poorly integrated grab-bag of approaches.
Rating	fair

Technical Review #2

Overall

Provide a brief explanation of your summary rating.

Comments	I would not rate this proposal highly for funding priority.
Rating	fair

Technical Review #3

proposal title: TMDL Impacts on Algal Productivity

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	-The goals are clearly stated, however, the objectives are not tied to testable hypotheses. -Poorly stated hypotheses; much too general - reads like a fishing expedition.
Rating	fair

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

Comments	-This proposal addresses topics germane to CALFED restoration activities, however, the conceptual model is too broad to be very useful. -There are other issues which sound good at first, but on further investigation, are not borne out. For example, they state that DNA extraction and fingerprinting of algae (T-RFLP) is a more rapid method for identifying phytoplankton. -Stable isotope work is not integrated into the project and is, in my opinion, superfluous. -There is really only one small paragraph describing how the Model will use the information gained from this research.
Rating	fair

Technical Review #3

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	-The scientific approach is does not address the Objectives of the proposal. -For example, what does the development of a phaeophytin sensor have to do with testing the hypothesis that water quality changes resulting from remediation efforts will impact phytoplankton productivity?
Rating	poor

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	-Not likely to succeed as designed. -Serious disconnect between Goals and Approach. -Too complex and convoluted an approach, requiring a lot more effort than expected.. -For example, how many duplicate, sixfoot diameter mesocosms (hydrocorrals) extending down to the 1% light depth will be required to test for the effects of grazing, temperature, light, "nutrients", iron, phosphorus, sediments? All this at 3, 4, 5 sites in the river? A serious effort to do this correctly would eat up most of the budget and take many years to get it right.
Rating	poor

Monitoring

If applicable, is monitoring appropriately designed (pre-post comparisons; treatment-control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Technical Review #3

Comments	-No mention as to what will be done with monitoring data.
Rating	fair

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	-Products are not adequately defined. -Expectations are nebulous. -Modeling is poorly detailed.
Rating	fair

Additional Comments

Comments	-This proposal purports to answer all the questions regarding how restoration will affect phytoplankton dynamics. I disagree. To me it reads like a loosely connected, group of smart scientists furthering their own research agendas.
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Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	-The PIs are highly qualified in this field of research and has vast experience in phytoplankton ecology. -PIs have strong backgrounds in regional issues.
Rating	excellent

Technical Review #3

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	-The budget is ridiculously high and not justified by products.
Rating	poor

Overall

Provide a brief explanation of your summary rating.

Comments	-Poorly thought out experimental design. -Disconnect between Objectives and Approach. -Hypotheses not tested by experimental design. -Bloated budget. -Objectives not related to testable hypotheses. -I do not recommend funding this project as it stands.
Rating	fair